CLAIMS

What is claimed is:

1. A method for automatic geometric alignment in a projection system comprising the steps of

displaying a first image pattern onto a screen of the projection system, wherein the screen includes a Fresnel lens,

reflecting back a portion of the light from the first image off of the Fresnel lens,

identifying the boundaries of the screen,

calculating the coordinates of a plurality of optimum locations based on screen boundary coordinates,

displaying a second image pattern,

positioning the second pattern at the calculated coordinates of a first optimum location of the plurality of optimum locations,

reporting the coordinates of the actual location of the second image pattern,

comparing the actual coordinates of the second image pattern with the calculated coordinates of the first optimum location, and

aligning the second image pattern with the calculated coordinates of the first optimum location.

2. The method of claim 1 wherein the first image pattern comprises a flat green field projected onto the screen and onto an over scanned area.

3. The method of claim 2 wherein the step of identifying the boundaries of the screen includes analyzing the difference in brightness of the reflected images reflected off of the screen and the over scanned area.

4. The method of claim 1 further comprising the step of deploying a reflective sheet interposing a projection unit and the screen.

5. The method of claim 1 wherein aligning the second image pattern with the calculated coordinates of the first optimum location includes adjusting the size or centering of the second image pattern.

6. The method of claim 1 further comprising the steps of

positioning the second pattern at the calculated coordinates of a second optimum location of the plurality of optimum locations,

reporting the coordinates of the actual location of the second image pattern,

comparing the actual coordinates of the second image pattern with the calculated coordinates of the second optimum location, and

aligning the second image pattern with the calculated coordinates of the second optimum location.

7. The method of claim 1 wherein the step of calculating the coordinates of the plurality of optimum locations based on screen boundary coordinates includes calculating the coordinates of n optimum locations and further comprising the steps of

positioning the second pattern at the calculated coordinates of n optimum locations,

reporting the coordinates of the actual location of the second image pattern at each of the n optimum locations,

comparing the coordinates of the actual location of the second image pattern at each of the n optimum locations with the calculated coordinates of each of the n optimum locations, and

aligning the second image pattern at each of the n optimum locations with the calculated coordinates of each of the n optimum locations.

8. A method for automatic convergence alignment in a projection system comprising the steps of

displaying a first image pattern at a first location on a screen comprising a Fresnel lens,

reflecting back a portion of the light from the first image off of the Fresnel lens,

identifying and storing the coordinates of the first location of the first image pattern,

displaying a second image pattern,

adjusting the second image pattern to position the second image pattern at the same first location of the first image pattern,

reporting the coordinates of the actual location of the second image pattern,

comparing the coordinates of the actual location of the second image pattern with the memorized coordinates of the first location of the first image pattern, and

aligning the second image pattern with the first location of the first image pattern.

9. The method of claim 1 further comprising the step of deploying a reflective sheet interposing the CRTs and the screen.

10. The method of claim 8 further comprising steps of

positioning the first image pattern at a second location,

identifying and storing the coordinates of the second location of the first image pattern,

displaying the second image pattern,

adjusting the second image pattern to position the second image pattern at the same second location as the first image pattern,

reporting the actual location of the second image pattern,

comparing the actual location of the second image pattern with the coordinates of the second location of the first image pattern, and

aligning the second image pattern with the second location of the first image pattern.

11. The method of claim 10 further comprising the steps of

displaying a third image pattern,

adjusting the third image pattern to position the third image pattern at the same first location as the first image pattern,

reporting the actual location of the third image pattern,

comparing the actual location of the third image pattern with the coordinates of the first location of the first image pattern, and

aligning the third image pattern to the same coordinates the first location of the first image pattern.

12. The method of claim 11 further comprising steps of

moving the third image pattern to a second location,

adjusting the third image pattern to position the third image pattern at the same second location as the first image pattern,

reporting the actual location of the third image pattern,

comparing the actual location of the third image pattern with the coordinates of the second location of the first image pattern, and

aligning the third image pattern with the coordinates of the second location of the first image pattern.

13. The method of claim 12 wherein the first, second and third image patterns comprise a multi-positional monochromatic geometric shape.

14. The method of claim 8 wherein the screen includes a Fresnel lens.

15. The method of claim 10 further comprising the steps of

moving the first image pattern to n locations,

identifying and storing the coordinates of the first image pattern at each of the n locations,

positioning the second image pattern to each of the n locations,

adjusting the second image pattern to position the second image pattern at of each of the same n locations of the first image pattern,

reporting the actual location of the second image pattern at each of the n locations,

comparing the actual location of the second image pattern at each of the n locations with the coordinates of the first image pattern at each of the n locations, and

aligning the second image pattern at each of the n locations with each of the n locations of the first image pattern.

16. A projection system comprising

a projection screen,

a image projection system optically coupled to the projection screen,

a deployable reflective sheet optically interposing the projection screen and image projection system, and

an image detection device optically coupled to the reflective sheet.

17. The projection system of claim 16 wherein the reflective sheet is a roll-up screen.

18. The projection system of claim 16 wherein the image detection device comprises a CCD camera.

19. A CRT projection system comprising

a projection screen,

a plurality of CRTs optically coupled to the projection screen,

a recordable medium comprising a software program convergence and geometric alignment of the projection system, and

a CCD camera optically coupled to the entire internally facing side of the projection screen and operably coupled to the recordable medium.

20. The projection system of claim 19 wherein the projection screen comprises a Fresnel lens, wherein the CCD camera is optically coupled to the entire internally facing side of the lens.

21. The projection system of claim 19 further comprising a roll-up reflective screen removably interposing the CCD camera and the screen wherein the CCD camera is optically coupled to the entire internally facing side of the screen.

22. The projection system of claim 19 further comprising convergence circuitry operably coupled to the recordable medium and the plurality of CRTs.

23. The projection system of claim 19 further comprising on screen display hardware operably coupled to the recordable medium and the plurality of CRTs.